

We claim:

1. A method for providing a barrier coating on a porous ceramic article which comprises the steps of:  
applying to the porous ceramic article a polymer solution or dispersion comprising a liquid vehicle, a cross-link promoter and a thermally cross-linkable, thermally pyrolyzable hydrocarbon polymer; and  
heating the ceramic article to a temperature sufficient to substantially remove the vehicle from the applied solution or dispersion and to effect cross-linking of the hydrocarbon polymer.
2. A method in accordance with claim 1 wherein the cross-linkable hydrocarbon polymer is a water-soluble polymer elected from the group consisting of amine-functional ionenes, polyvinyl alcohols, polyacrylic acids, and polyacrylic amines.
3. A method in accordance with claim 1 wherein the cross-linkable hydrocarbon polymer is an amine functional ionene polymer having a molecular weight in the range of 5000–200,000.
4. A method in accordance with claim 3 wherein the cross-link promoter is selected from the group consisting of epichlorohydrin and diamines.
5. A method in accordance with claim 3 wherein the ceramic article is heated to a temperature in the range of 80-120°C. to effect cross-linking of the hydrocarbon polymer.
6. A method for applying a catalyst or catalyst washcoat to a ceramic catalyst support comprising the steps of:  
applying to the catalyst support a polymer solution or dispersion comprising a liquid vehicle, a cross-link promoter, and a thermally cross-linkable, thermally pyrolyzable hydrocarbon polymer;

heating the ceramic article to a temperature sufficient to substantially remove the vehicle from the applied solution or dispersion and to effect cross-linking of the hydrocarbon polymer to thereby provide a polymer-coated support;

applying to the polymer-coated support an aqueous washcoating or catalyst coating and drying the coating or washcoating to provide a catalyst-coated or washcoated support; and

heating the catalyst-coated or washcoated support to a temperature at least sufficient to remove the cross-linked polymer coating.

7. A method in accordance with claim 6 wherein the porous ceramic substrate is a ceramic honeycomb having a principal crystalline phase selected from the group consisting of aluminum titanate and cordierite.

8. A method in accordance with claim 6 wherein the aqueous washcoating or catalyst coating comprises a dispersion of alumina, alumina precursors, or mixtures containing alumina.

9. A porous ceramic article having a pore structure characterized by the presence of a coarse pore volume and a micropore/microchannel pore volume, the pore structure supporting a cross-linked polymer barrier coating preferentially disposed within micropore/microchannel pore volume of the article.

10. A porous ceramic article in accordance with claim 9 which has a ceramic composition selected from the group consisting of aluminum titanate and cordierite ceramics.

11. A porous ceramic article in accordance with claim 10 wherein the coarse pore volume of the pore structure is open for the deposition of a washcoating.